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Meeting Information

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The Functional Transfer of the Wheat Gene *Lr34* into Rice and Its Resistance Against Rice Blast

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Lr34 is a wheat gene which confers a durable, partial and broad spectrum resistance against the three wheat rusts and powdery mildew. *Lr34* encodes for an ABC transporter protein and only one resistance-conferring *Lr34* allele (*Lr34res*) has been found in wheat so far. *Lr34*res evolved as a result of two gain-of-function mutation that occured post domestication, 10000 years ago. *Lr34res* is only found in cultivated wheat but not in wild wheat progenitor. Consistent with the very recent emergence of *Lr34res*, an *Lr34*-like disease resistance with a similar durability and broad-spectrum specificity has not been reported in other important crop species sich as rice or barley. We therefore transformed the wheat *Lr34res* into rice, one of the most important cereals, and observed that the transgenic lines showed resistance against different rice blast (*Magnaporthe oryzae*) isolates on a macroscopic and a microscopic level. This hemi-biotrophic fungus is one of the most devastating rice diseases in the world and causes important yield losses every year. *Lr34*res was shown to provide resistance against biotrophic fungi in wheat but with these results we could show that the spectrum of resistance is even broader, including hemi-biotrophic fungi as well. More interestingly, it was possible to identify one transgenic line with a plant development and some yield parameters comparable to the sister line but with a resistance against rice blast. In the future, *Lr34res* would be a very useful tool in order to improve disease resistance in rice or other species.

Handouts
The wheat durable, multipathogen resistance gene Lr34 confers partial blast resistance in rice.pdf (647.5 kB)

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